Name: _____

CASE

Activity 4.2.2 Just Winging It

Purpose

Animal tissues are comprised of specialized cells to provide structure and function for each type of tissue. Common animal tissues are connective, epithelial, fluid, muscle, and nervous. Each type of tissue has a specific purpose for the physiological functioning and movement of animals.

Connective tissues provide structure and include bones, cartilage, ligaments, and tendons. Bones are calcified material providing structure for animals and are classified as either short, long, flat, or irregular. Cartilage is flexible and found between bones as well as other structures like the ear and nose. The last two connective tissues are tendons and ligaments. Tendons connect muscle to bone and ligaments help hold two bones together. Skin is an epithelial tissue protecting an animal. Muscle tissues are mainly found in smooth, cardiac, and skeletal. Cardiac and smooth muscles are involuntary and skeletal muscles are voluntary.

These tissues are found throughout the body of animals. In areas of joints between bones, several of these tissues are commonly found. An example of this is a chicken wing. The edible portions of a cooked chicken wing are the skin (epithelial layer) and muscle. The tough parts found under those, are the ligaments, cartilage, tendons, and bone. Can you tell the differences in tissue by dissecting a chicken wing?

Materials

Per pair of students:

- Dissection kit
- Dissection tray
- Raw chicken wing
- Beef heart sample
- Compound microscope
- Dissecting microscope
- 2 microscope slides
- 2 cover slips
- Dropper
- Paper towel
- Methylene blue stain

Per student:

- Disposable gloves
- Lab apron
- Pencil
- *Agriscience Notebook*

Procedure

You and a partner will dissect a chicken wing and examine tissues that make up the internal structure of the wing. Once the tissues have been identified, you will prepare slides of muscle tissue from the wing and a sample of beef heart to compare differences between the types of muscle tissue.

Part One – Remove the Skin

1. Use the scissors from the dissection kit to cut the skin and remove it from the entire chicken wing. Once the skin is removed, set the skin aside.

2. Pin the thick end of the wing down with your hand and move the tip of the wing flexing the joints. Observe the motion of the tissues as they function.
3. Examine the surface of the skinless muscle (i.e., the pale pink tissue) under the dissecting microscope and answer the questions in Table 1 of *Activity 4.2.2 Student Worksheet*.
    - Leave the chicken wing in the dissection tray, simply slide the wing to the edge of the tray and place the tray in the viewing area of the microscope.

Part Two – Remove the Muscle

1. Using the scissors cut away the muscle tissue from the bone being careful to leave the white, rubbery tissue in place where possible, and try to prevent the joints from separating.
2. Set the muscle tissue aside for Part Three.
3. Examine the connective tissue, which includes tendons, ligaments, bones, and cartilage under the dissecting microscope and record your observations in Table 2 of *Activity 4.2.2 Student Worksheet*.

Part Three – Compare Muscle Tissue

1. With the muscle tissue that you removed from the chicken wing, slice a very thin sample of tissue using the scalpel and transfer it to a glass slide.
2. Spread the tissue flat on the slide.
3. Use a dropper to add a drop of water to the muscle tissue.
4. Add a coverslip and blot excess water touching a paper towel to the underside of the slide.
5. If the fibers are difficult to see, remove the coverslip and add a drop of methylene blue stain. Replace the coverslip and blot excess dye with a paper towel.
6. Record observations in Figure 1 of Table 3 of *Activity 4.2.2 Student Worksheet*.
7. Repeat Steps 1 – 3 of Part Three using the cardiac tissue provided by your teacher.
8. Record observations for cardiac tissue in Figure 2 of Table 3 of *Activity 4.2.2 Student Worksheet*.
9. Clean up the laboratory and equipment according to your teacher's instructions. Make sure that all tissue is placed in the designated waste container.

Conclusion

1. What are the similarities among tendon, cartilage, and ligament tissue?

2. Explain how muscles and connective tissues interact to provide movement to animal limbs.

3. Describe the differences in structure between cardiac and skeletal muscle tissues.

4. Cardiac, striated (skeletal), and smooth muscles are the basic types of muscle tissue found in animals. Provide one example of where each muscle type is found in an animal and list its specific function.

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Activity 4.2.2 Student Worksheet

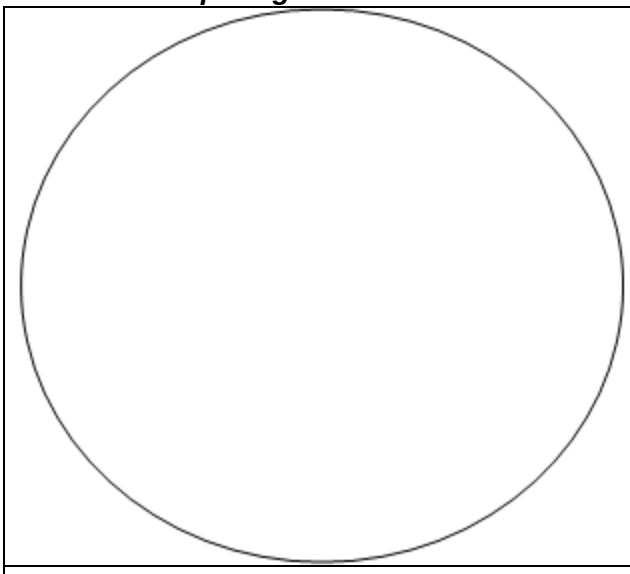
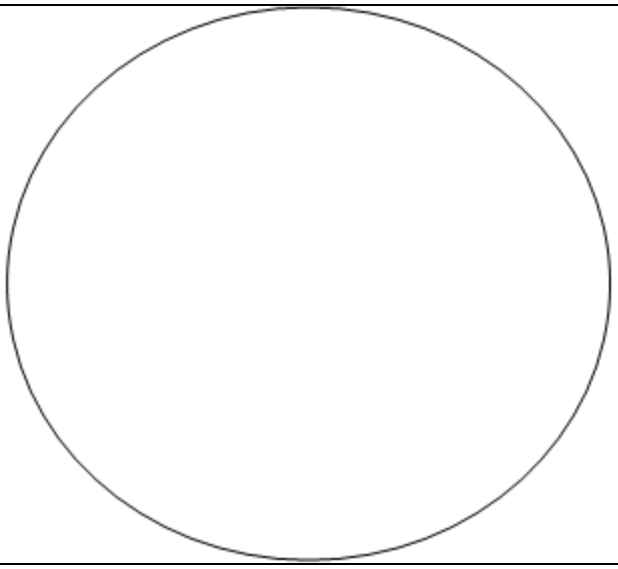
Table 1. *Observations*

Poke the muscle tissue with your scalpel. How easy does it cut compared to the skin?
From your observation in the previous question, what can you conclude about the function of the skin?
What type of tissue comprises the skin of chicken wings?
List the colors of the different tissues observed in the skinless wing.
What types of connective tissue can you see when you flex the wing joints?

Table 2. *Subcutaneous Observations*

Connective Tissue	Location of Tissue	Description of Tissue	Function of Tissue
Bone			
Cartilage			
Ligament			
Tendon			

Table 3. *Comparing Muscle Tissue*

	
Skeletal Tissue	**Cardiac Tissue**